

or papillary tubes, here sloping outwards on each side the cord; *c*, truncated vessels of the marginal plexus; *d, d*, small channels of intercameral communication; *e*, grand semilunar or crescentic channel of ditto; *f*, septum.

*Fig. 7.* Diagram of vertical section to show the situation of the interseptal vessels: *a, a*, interseptal vessels; *b*, septum; *c*, grand channel of intercameral communication; *d*, part of spicular cord.

*Fig. 8.* Enlarged view of first-formed chambers of *Operculina Arabica*: *a*, central cell or chamber; *b, b, b*, probable forms of last chambers in process of development.

*Fig. 9.* Diagram of vertical section of *Nummulites acuta*, Sow.: *a*, spicular cord?; *b*, truncated vessels of marginal plexus; *c, c*, chambers of central plane; *d, d*, vertical interseptal vessels (the "perforations," &c. of Dr. Carpenter); *e, e*, horizontal interseptal vessels; *f, f, f*, chambers on each side the central plane; *g, g, g*, vertical tubes.

XVI.—*On some genera of the Icacinaceæ.* By JOHN MIERS,  
Esq., F.R.S., F.L.S.

[Continued from p. 119.]

EMMOTUM.

THIS neglected genus was proposed by Desvaux in 1825 upon a plant from Guiana. By Endlicher it was referred to *Leretia* of the 'Flora Fluminensis,' with which it neither accords in the appearance of the leaf nor the mode of its inflorescence: Hamilton's character as given in his 'Prodromus,' notwithstanding its brevity, is sufficiently well marked to show that it does not differ from *Pogopetalum*, founded by Mr. Bentham in 1840; indeed the *Emmotum fagifolium*, Desv., corresponds with *Pogopetalum acutum*, Benth., both from Guiana, so as to leave no doubt of their identity: according therefore to the austere rule of science, the latter name must give way to the former. Mr. Bentham in establishing his genus recorded two species, and has since described two others, and I have now to add a fifth. All the species, which are from Guiana and intertropical Brazil, seem to form good-sized trees, with very thick coriaceous leaves of a peculiar appearance; their inflorescence is in axillary crowded fascicles of rather small flowers, which are distinguished by having petals densely beset on their inner face with long red silky hairs arising from an elevated costal nervure. Their chief peculiarity, however, consists in the unusual structure and singular mode of dehiscence of their anthers, which are formed of two opposite, unilocular, valveless, and separate cells, the pollen being discharged extrorsely through a fissure arising from the secession of the dorsal margin of each boat-shaped cell from the very fleshy connective, features that have hitherto escaped obser-

vation. *Emmotum* offers also another peculiarity in its ovarium with three radiate cells, placed excentrically on the somewhat gibbous and anterior side of the ovarium. These points of structure are so different from the development met with in other genera of the *Icacinaceæ*, as naturally to lead to the suspicion that *Emmotum* may not belong to this family; but we must remember that in other respects it accords, viz. in its exstipulate alternate leaves, small flowers with a persistent unchanged calyx, petals with valvate æstivation, alternate stamens, simple style, and suspended collateral ovules. I have therefore retained the genus doubtfully, as a separate tribe of the *Icacinaceæ* (*ante*, S. 2. vol. ix. p. 223), until its true place in the system can be ascertained, which will be determined by a knowledge of the structure of the fruit and seed and the form and position of its embryo. The name, I presume, has been derived from *ἐν* and *μοτὸς*, *linteum*, on account of the densely intertwined hairs that line the petals, a character that also suggested the name of *Pogopetalum*. These hairs, when examined under the microscope, appear flattened and covered with numerous prominent transparent glandular dots as in *Leretia*. The following is an outline of its generic features:—

**EMMOTUM**, Desv. *Pogopetalum*, Benth.—*Flores* perfecti. *Calyx* brevissimus, 5- rarius 4-dentatus, liber, fructifer immutatus. *Petala* 5, rarius 4, lineari-oblonga, carnosula, intus ad carinam longitudinalem pilis rufis sæpius longis et crispatis densissime barbata, æstivatione valvata, mucrone apicali introflexo. *Stamina* 5 vel 4, petalis alterna, iis vix breviora, omnino libera; *filamenta* carnosula dilatata, incurva, apice repente acuta; *antheræ* 2-loculares, *connectivo* crasso, interdum loculis utrinque sejunctis breviores, vel sæpe in mucronem subulatum incurvulum ultra loculos subantrorsim positos producto, imo cordato affixæ, *loculis* membranaceis, cymbæformibus, evalvibus, margine posteriori a connectivo omnino soluto hinc extrorsim dehiscentibus. *Pollen* ovale, longitudinaliter sulcatum. *Ovarium* liberum, oblongum, subgibbum, pilosum, disco hypogyno parvo sistens, 3-loculare, loculis excentrice radiantibus; *ovula* in quoque loculo 2, juxta apicem appensa et subcollateraliter superposita. *Stylus* excentricus, erectus, teres. *Stigma* e dentibus 3 brevissimis erectis minutum. *Drupa* globosa, abortu 1-ocularis; cætera ignota.—Frutices Guianenses et Brasilienses *sempervirentes*; folia *alterna*, *exstipulata*, *coriacea*, *integra*, *nitida*, *subtus tomentosa*; cymæ *fasciculatæ*, *axillares*, *multifloræ*; flores *parvi*, *aggregati*, *cum pedicellis brevissimis articulati*, *bracteati*.

1. *Emmotum orbiculatum*. Pogopetalum orbiculatum, *Benth. Linn. Trans.* xviii. 685. tab. 42;—arbor 2-orgyalis, ramulis cinereo-vel fulvo-tomentosis, foliis ovato-orbiculatis, apice brevissime ac obtusissime acuminatis, coriaceis, nitidis, supra lucidis, rachi tomentoso, nervis parallele incurvo-divaricatis, venis creberrime transversis immersis, subtus cum petiolo crasso profunde canaliculato incano-vel fulvo-tomentosis; ovario hispido, fructu globoso, calyce immutato suffulto.—In Guiana Brasilæ ad fluv. Padauri, confl. fluv. Nigri.—*Schomburgk.*—(v. s. in herb. Mus. Brit. et Hook. fructu immaturo, Rio Preto, Prov. Pernambuco.—Gardner, n. 2941.)

This species is remarkable for the shape of its leaves, which are almost orbicular at the base and summit, are  $2\frac{3}{4}$  to  $3\frac{1}{4}$  inches long,  $2\frac{1}{2}$  inches broad, on a deeply grooved petiole 6 or 7 lines in length; they are thick and coriaceous, very polished above, with a finely shagreened surface, and densely covered beneath with short yellowish tomentum: the simple racemes with a few immature drupes are about  $\frac{3}{4}$  inch long.

2. *Emmotum acuminatum*. Pogopetalum acuminatum, *Benth. loc. supr. cit.* 685;—arbor 5-orgyalis, foliis ovatis oblongisve, apice longissime et anguste attenuatis, mucronulatis, coriaceis, fusco-rufulis, supra lucidis et glaberrimis, in costam sulcatis, nervis paucioribus vix prominulis, venis transversis immersis, subtus pallide ferrugineis, glandulis minutis creberrime punctatis, pube rara instructis, petioloque sulcato leviter pubescentibus, demum glabris; racemis geminis, floribus aggregatis griseo-pilosis, petalis ovali-oblongis, intus in carinam pilis longis rufis lanatis, marginibus utrinque glabris; ovario pilis destitutis et e glandulis minutissimis asperis glauco-pruinoso, disco glabro insito; stylo excentrico elongato, stigmate obsolete 3-dentato.—Rio Negro, Brasilæ (Schomb. 970).

The branchlets are somewhat compressed and angularly striated: it is however distinguished from the other species by the long attenuated summit of the leaves, which are also of a remarkably dark copper or reddish colour when dried; they are about 4 or  $4\frac{1}{2}$  inches long, including the suddenly narrow apex of half an inch in length; they are  $1\frac{3}{4}$  to  $2\frac{1}{2}$  inches broad, on a petiole 5 lines long; the nervures, about seven pairs, are parallel, very divergent, curving, with finely reticulated transverse veins; the upper surface is polished and finely shagreened; beneath they are of a ferruginous hue, dead, almost glabrous, and when viewed under the lens seem covered with minute raised glandular dots: generally two racemes spring out of each axil, from  $\frac{1}{2}$  to  $\frac{3}{4}$

inch long, which, when younger, appear like a crowded globular axillary fascicle. The anthers in structure resemble those of the following species. The long red hairs that densely spring from the inner keel of the petals under the lens appear marked by large prominent glands in two uneven series, so that they seem almost torulose.

3. *Emmotum fagifolium*, Desv. in Ham. Prodr. Fl. Ind. Occid. p. 29. *Pogopetalum acutum*, Benth., Hook. Lond. Journ. Bot. ii. 377;—ramis angulatis, rufo-tomentosis; foliis oblongis, ovatisve, apice repente lineari-attenuatis, basi rotundatis vel truncatis, valde coriaceis, supra sublucidis, glaberrimis, nervis divaricatis, pubentibus, approximatis, incurvo-parallelis, sulcatis, venis transversis immersis, subtus præsertim in nervis sparse sericeo-pubescentibus, nervis tenuibus subprominulis, petiolo canaliculato tomentoso; racemis geminis, axillaribus, petiolo vix longioribus, floribus aggregatis, aurantiaco-vel cano-tomentosis, petalis lineari-oblongis, intus pilis longis rufis in carinam lanatis, lateribus glabris, filamentis tenuioribus, dilatatis, antheris ovatis, vix mucronulatis, loculis oppositis, complanatis, ovario pilis longis hispido (nec glabro), stylo elongato, gracili.—Guiana Gallica, Desvaux.—*v. s. in herb.* Hook. (Leprieur et Martin).

There can be little doubt that this is the plant described by Desvaux as the "*Bois d'Agouti*," and which is identical with the *Pogopetalum acutum* of Mr. Bentham: the leaves in form much resemble those of the preceding species; they are from  $3\frac{3}{4}$  to  $6\frac{3}{4}$  inches long, and  $2\frac{1}{4}$  to  $3\frac{3}{4}$  inches broad, on a slender petiole half an inch in length; the apex is very suddenly acuminate by a linear point, half an inch in length, and often little more than a line in breadth. The flowers are closely aggregated, each being articulated on its short pedicel; the calyx is cupuliform, pubescent, and cleft into five ovate, fleshy and somewhat acute lobes, which are slightly imbricated in æstivation, as in *Platea*; the petals are clothed outside with short gray adpressed hairs, and the prominent internal keel is furnished with a line of very densely-set long red spreading woolly hairs, which are flattened and marked with glandular dots; the stamens are nearly as long as the petals; the filaments are fleshy, compressed and broader at the base, somewhat terete and subulate above, and suddenly bent back at the apex, where the point is affixed to the front of the red fleshy connective, just above its short basal sinus; the anthers are therefore strictly extrorse; the connective is almost terete, somewhat compressed, erect in position, and about one-sixth of the length of the filament; the two anther-cells are di-

stinctly separate, thin, membranaceous, white, flattened, boat-shaped and valveless, fixed one on each side of the connective; they are longer both above and below, so that the anthers are emarginated at the apex and base; they generally open extrorsely by the separation of the posterior margin of the cells from the connective, or they sometimes, though rarely, separate by both margins. The ovarium has been described as being glabrous, but I have constantly found it clothed with long, erect, setaceous, shining, white hairs; the lower part is invested by a glabrous, adnate, cupshaped disk: the style is erect and somewhat bent, glabrous, rather subulate, slender, and of the length of the stamens: there is no apparent stigma, but the apex of the style is hollow and crowned with three very minute teeth: the ovarium contains three radiate, excentric cells, each showing two ovules suspended from near the apex.

4. *Emmotum affine*, n. sp. *Pogopetalum affine*, *Planch. MSS.*;—foliis ovalibus e basi rotundato gradatim angustioribus apice fossulato et deflexo longe attenuatis, subconvexis, supra nitentibus, costa sulcatis, nervis subprominulis, venis creberrime transversis immersis, subtus ferrugineis, et glauco-pruinosis e pilis brevissimis adpressis sub lente visuris, margine valde reflexo, petiolo subtenui sulcato rufo-glaucescente; racemis axillaribus, floribus aggregatis cano-pilosis, petalis intus in carinam pilis longissimis rufis dense lanatis lateribus glabris: staminibus spec. præced.: ovario piloso, disco glabro insito.—Brasilia.—v. s. in herb. *Hook.* (Sellow.)

This species comes very near *E. acuminatum*; the leaves are very shining above as in that species, and ferruginous beneath, but the hairs that clothe its under surface are so minute as to be seen only under a strong lens; they are somewhat convex above and the margins are very revolute, the attenuated apex being deeply channelled and curved downwards; they are about  $4\frac{1}{4}$  inches long and 2 inches wide, with a somewhat slender and almost terete petiole, which is often suddenly deflexed. The inflorescence is axillary in a few of the upper leaves, but is mostly terminal in branching alternate racemes, each about three-quarters of an inch long.

5. *Emmotum nitens*. *Pogopetalum nitens*, *Benth. loc. citat.*;—ramis striatis; foliis oblongis, acuminatis, coriaceis, supra glaberrimis, pallide glaucis, sub-nitentibus, subconvexis, nervis subprominulis, venis transversis immersis, subtus pube sericea adpressa densa incana aut fulva vestitis, nervis valde prominentibus, margine reflexo, petiolo elongato cano-tomentoso

canaliculato sæpe deflexo; paniculis racemosis, ternis, axillaribus, petiolo sublongioribus, floribus dense aggregatis, griseo-pilosulis, petalis lineari-lanceolatis, acutis, summo patentim reflexis, intus ad carinæ basin apicemque fasciculo pilorum donatis, pilis brevibus albidis; staminibus incurvis crassiusculis, connectivo tereti, imo cordato, in mucronem obtusum incurvum longe protenso, antherarum loculis sejunctis, antice contiguis, subparallelis, margine dorsali dehiscentibus; ovario pilis brevibus micantibus adpressis vestito, disco glabro insito; stylo brevissimo valde excentrico.—*Brasilia intertropica*.—*v. s. in herb. Hook.*—*Prov. Goyaz, Minas Gerães et Pernambuco* (Gardn. n. 2941, 3309, 4451); *Rio S. Francisco* (Blanchet, 2889).

In this species the leaves, in the dried state, present a remarkably pallido-glaucous and lurid aspect above, and are covered below with yellow, very short, adpressed and bright tomentum; the upper surface is shining, with prominent nervures, and under a lens appears marked with numerous minute impressed dots, between which are seen still more numerous raised resinous spots; they are generally about 4 inches long and 2 inches broad, on a longer and more slender petiole, about 9 lines in length. One, two or three short branching racemes, about the length of the petioles, crowded with numerous flowers, spring from each axil; the stamens are incurved, about the length of the petals, the anthers being nearly as long as the broad fleshy filaments; the thick, fleshy, almost terete connective is slightly cordate at its base, is somewhat incurved and subulate, and terminates in an obtuse point that much exceeds the length of the anther-cells; this is affixed just in the angle of its sinus in front, to the obtuse apex of the filament, so that the anthers, though at first sight apparently basifixed, are in reality also extrorse in position: the anther-cells are white, of thin texture, linearly boatshaped, quite separate, nearly parallel, and fixed extrorsely upon the sinus of the inner face of the connective, and they discharge their pollen by the secession of the exterior margins from the body of the connective. The pollen is oval, marked by three longitudinal lines. The ovarium is shorter than the stamens, covered with short erect hairs, and seated on a small fleshy glabrous disk; it is 3-celled as in the last-described species; the style is very short, very excentric, hollow at its apex, and terminated by three very minute teeth.